



A.D. 1872, 5th MARCH. N° 671.

SPECIFICATION

OF

ROBERT BLACKBURN.

TREATING SEWAGE.

LONDON:

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1872.



A.D. 1872, 5th MARCH. N° 671.

Treating Sewage.

LETTERS PATENT to Robert Blackburn, of Exeter, in the County of Devon, for the Invention of “**IMPROVEMENTS IN APPARATUS AND IN MEANS FOR TREATING SEWAGE FOR AGRICULTURAL PURPOSES.**”

Sealed the 30th August 1872, and dated the 5th March 1872.

PROVISIONAL SPECIFICATION left by the said Robert Blackburn at the Office of the Commissioners of Patents, with his Petition, on the 5th March 1872.

I, ROBERT BLACKBURN, of Exeter, in the County of Devon, do hereby
5 declare the nature of the said Invention for “**IMPROVEMENTS IN APPARATUS
AND IN MEANS FOR TREATING SEWAGE FOR AGRICULTURAL PURPOSES,**” to be as
follows :—

This Invention relates, as far as apparatus is concerned, to the
employment of one or more revolving screens or strainers of cylindrical
10 or other form, into which the sewage is caused to enter, for arresting the
excreta or other solid matter before it or they pass on to endless cloths

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on their way to the squeezing of pressing rolls, if such are used, as described in the following :—

I take the sewage as delivered from the sewers over and through divided or partitioned troughs or catch pits, so as to enable stones, gravel, and other heavy bodies to deposit themselves, such deposit being 5 removed at intervals.

The sewage then passes on, and light bodies such as wood, cork, straw, are arrested in their progress by means of stationary bars of iron fixed as a screen, or by means of perforated plates.

After the heavy and light bodies are divided from the sewage, or 10 are deposited, sewage is then allowed to flow through the revolving strainers. The strainers are made conical in form, and may be covered with perforated zinc, copper, or iron, but by preference are covered over with gauze wire. The strainers are caused to revolve by suitable shafting put in motion by steam, water, or other power; the fluid portion of the 15 sewage passes through the perforations or the gauze wire, and arrests the excreta and other bodies, and the revolving strainer deposits the manure on to an endless cloth or cloths, which are caused to move and so deliver the manure through squeezing rolls or into receptacles for treatment by hydraulic or other drying process. The manure is then 20 mixed with disinfectants and other matters, and also with powdered charcoal, soot, and waste woollen fibre.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Robert Blackburn in the Great Seal Patent Office on the 5th September 1872.

25

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, ROBERT BLACKBURN, of Exeter, in the County of Devon, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Fifth day of March, in the year of our Lord One thousand eight hundred and seventy-two, in the 30 thirty-fifth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Robert Blackburn, Her special licence that I, the said Robert Blackburn, my executors, administrators, and

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assigns, or such others as I, the said Robert Blackburn, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and
5 vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for “IMPROVEMENTS IN APPARATUS AND IN MEANS FOR TREATING SEWAGE FOR AGRICULTURAL PURPOSES,” upon the condition (amongst others) that I, the said Robert Blackburn, my executors or administrators, by an instrument in writing under my,
10 or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

15 **NOW KNOW YE**, that I, the said Robert Blackburn, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, reference being had to the Drawings hereunto annnexed, that is to say :—

20 This Invention relates, as far as apparatus is concerned, to the employment of one or more revolving screens or strainers of cylindrical or other form, into which the sewage is caused to enter, for arresting the excreta or other solid matters before it or they pass on to endless cloths on their way to the squeezing or pressing rolls, if such are used, as
25 described in the following :—

I take the sewage as delivered from the sewers over and through divided or partitioned troughs or catch pits, so as to enable stones, gravel, and other heavy bodies to deposit themselves, such deposit being removed at intervals.

30 The sewage then passes on, and light bodies such as wood, cork, and straw are arrested in their progress by means of stationary bars of iron fixed as a screen, or by means of perforated plates.

After the heavy and light bodies are divided from the sewage, or are deposited, the sewage is then allowed to flow through the revolving
35 strainers. These strainers are made conical in form, or parallel and set out at an angle, and may be covered with perforated zinc, copper, or iron,

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or gauze, the lower ones by preference being always covered over with gauze wire. The strainers are caused to revolve by suitable shafting put in motion by steam, water, or other power; the fluid portion of the sewage passes through the perforations or the gauze wire and arrests the excreta and other bodies, and the revolving strainer deposit the 5 manure on to an endless cloth or cloths, which are caused to move and so deliver the manure through squeezing rolls or into receptacles for treatment by hydraulic or other drying process. The manure is then mixed with disinfectants and other matters, and also with powdered charcoal, soot, and waste woollen fibre. 10

The manner in which I propose to arrange my revolving screens for the reception of sewage matter and the separation of the solid or non-liquid portion, is represented in the accompanying Drawings, these being respectively a plan and side elevation.

a is the outlet from the sewer or drain b , the outlet being fitted with 15 a penstock or flush valve or valves c to check and limit the flow into the receiver d , this being fitted with a partition e to prevent the passage of stones, gravel, or other heavy impurities. The upper or any part of this partition can be formed of bars or other forms of strainer to retain floating bodies, such as cork, straw, or wood thereon. 20 The wall e^1 at the lower end of the receiver, trough, or catch pit has an aperture f in it, through which the comparatively liquid portion of the sewage is allowed to flow, the aperture opening right and left to divide the stream and to feed it into two or more circular revolving screens g, g , arranged upon rollers h, h , in proximity, the screens being 25 of cylindrical form, so that a continual turning over of the sewage is effected. These cylindrical screens are set at an angle to induce the material to fall gradually to its opposite end, where the portion not fallen through the meshes tip out on to inclined plates i, i , to lead it on to endless travelling belts j, j , and from thence to squeeze rollers where 30 the remaining moisture is removed. The more liquid portion of the sewage which passes through the meshes of the first screen is received upon slopes k, k , and it is led thereby to other circular revolving screens l, l , with finer meshes through which none but plain liquid will pass, the whole of the flocculent matter being kept back and afterwards 35 deposited upon other endless belts m, m , to be carried to other squeeze rollers if desired. The cylindrical screens are caused to revolve at any

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degree of speed by endless bands n, n , passing over guide pullies p, p , and a pair of riggers q, q , upon a separate shaft r , this being driven by an engine, water power, or other means, as found desirable, and they can be coated or covered with any material of a permeable character either
5 all over their exterior surfaces, or over a portion only, to effect the total separation of the solid particles from the liquid.

I have shown the cylindrical screens as being parallel and set at an inclination, but they may be of tapered form. There is of course no limit to the construction or size of the cylinders, or to the number of
10 them to be employed, those points being dependent upon the extent of population of the district.

The solid portions from both the upper set and the lower set of endless belts can be discharged into the same receiver, and then led to the squeeze rolls, or it can be precipitated into tanks, amalgamated with
15 chemical or other bodies, and converted into a valuable manure.

The liquid portions, strained and separated from the solids, can pass away into receiving pits, and be also treating with chemicals, after which it can be run through pipes or channels for the irrigation and fertilization of land, or away to the sea, as thought fit.

20 If the cylindrical screens or the coverings upon them are liable to be choked, I propose to allow a jet of water to flow over them while they are revolving, which water may be more or less impregnated by chemical matters as to fix the ammonia in the sewage liquid, by that means the tanks can be dispensed with and the liquid run direct to the farms for
25 irrigation purposes.

I do not limit myself to the arrangement or disposition of the screens, as shown, as they can be arranged and disposed in any suitable manner, and according to circumstances dependent upon district.

I claim as my Invention, the means substantially herein-before set
30 forth for receiving, separating, discharging, and treating sewage matters for agricultural purposes ;

And, secondly, I claim the employment of revolving screens for the

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reception and separation of the liquid portion from the solid portion of sewage, substantially as described and shown.

In witness whereof, I, the said Robert Blackburn, have hereunto set my hand and seal, this Third day of September One thousand eight hundred and seventy-two.

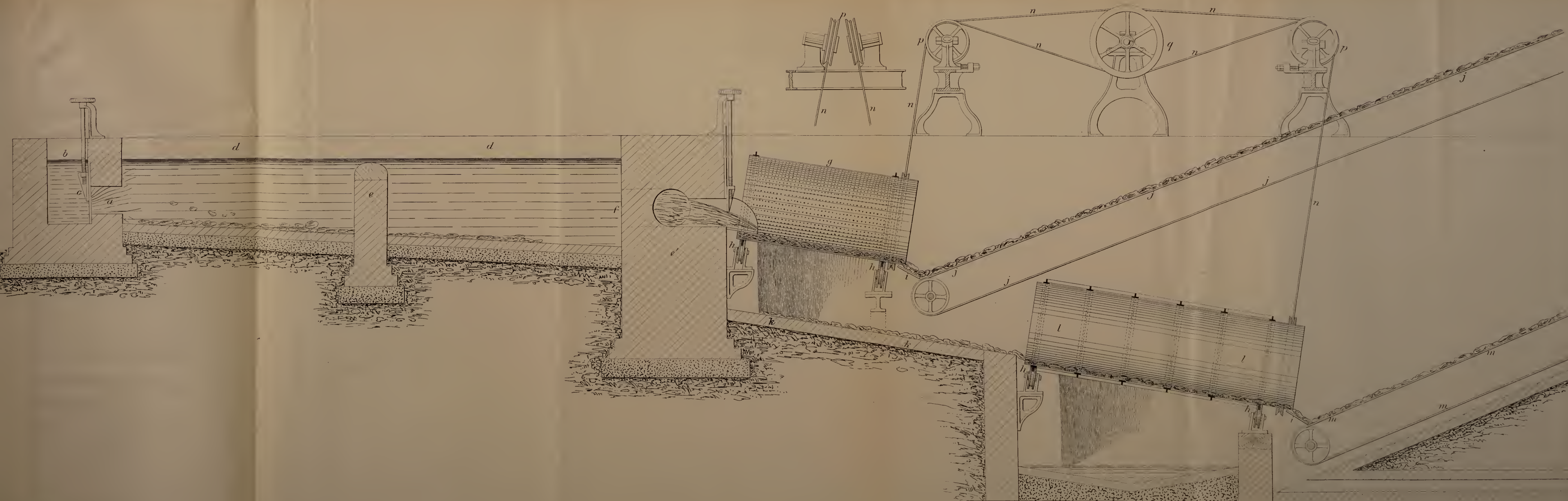
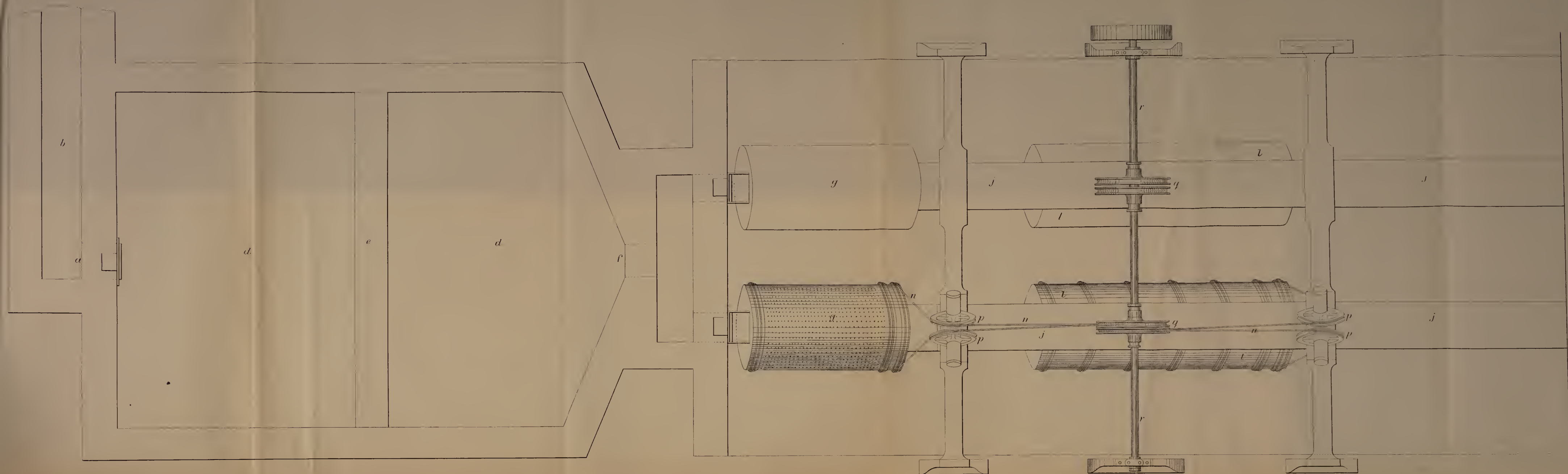
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ROBERT BLACKBURN. (L.S.)

LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1872.





The filed drawing is not colored.

Drawn on Stone by Malby & Sons

